WATER RESOURCES RESEARCH GRANT PROPOSAL

Title: Using GIS Databases to Estimate Stormwater Runoff, Wayne Huber, Oregon State University

Abstract

This project will attempt to couple current hydrologic models for stormwater quality and quantity to GiS-support urban planning.

Duration: February 1, 2000 - January 31, 2001

Fiscal Year 2000 Funds Requested:	Total	$ 6,615
	Direct	$ 4,737 + $1,878 tuition
	Indirect	$ 0
Matching Funds to be Allocated:	Total	$ 8,778
	Direct	$ 5,811
	indirect	$14,590

Principal Investigator(s):

Wayne Huber, Professor Department of Civil, Construction, and Environmental Engineering Oregon State University Corvallis, OR 97331 541 -737-6150 wayne.huber~orst.edu

Key Collaborators:

None

Congressional District: Oregon #5

Critical Need for Research

Stormwater management is rarely incorporated into decisions related to urban land use planning. When such analyses are conducted, the modeling of hydrologic processes by urban planner lacks both detail and specificity to provide accurate predicitions. There is a critical need to demonstrate the effectiveness of coupling of GIS information with advanced hydrologic and nonpoint source modeling efforts. Such coupling should lead to better planning for stormwater management by improving the efficacy of models employed for this purpose. Specifically, methods are needed to link GIS data with flow patterns within a proposed development.

Expected Results, Benefits, and Information

The expected results will be a survey of existing methods for predicting stormwater quality and quantity that can be used by urban planners. This project will be conducted in cooperation with Project 04 to provide urban hydrologic modeling to urban land use

planning models. The project will allow verification of whether existing hydrologic models will accurately predict stormwater runoff and whether such models can be appropriately introduced to allow their use by urban planners. The ultimate result would be a resource web page that urban planners could use to make decisions about specific land use patterns.

Goals and Objectives

The goal of the project is to intergrate hydrologic modeling into the process of urban planning to allow minimization of stormwater impacts.

The objectives are:

- Survey various hydrologic methods that could be used to couple GIS datasets with predictions of stormwater quality and quantity;

- Determine the effectiveness of such models to predict runoff for a specific site in Corvallis, OR in cooperation with Project 04; and

- If applicable, develop a web-based site to assist urban planners with predictions of stormwater quality and quantity under various development scenarios.

Methods, Procedures, and Facilities

A critical review will be done of available models for integration with GIS databases and planning-level activities. Such models range from highly sophisticated numerical procedures to very simple models using runoff coeffficients and spreadsheet analyses of water quality.

The models will be used to evaluate the effectiveness of best management practices (BMPs) routinely used in the design of new developments. Specific tactical approaches such as the use of wetlands, overland flow, infiltration devices, oil-water separators, and compost filters to remove pollutants will be evaluated using the ASCE-EPA BMP databases.

The work in this project will be done in cooperation with Kellett and Girling in Project 04. The models will be incorporated into their analyses and data collection.

Technology Transfer

The technology transfer will primarily occur by development of the web-based site to assist urban planners with predictions of stormwater quality and quantity under various development scenarios. The web-based site will be placed upon the OWRRI web site. Joint publications related to this project will be developed with Kellett and Girling and published in appropriated urban planning and engineering hydrology journals.